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## Test 1270: Allis-Chalmers 5020 DSL

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# NEBRASKA TRACTOR TEST 1270 — ALLIS-CHALMERS 5020 DSL

## POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption			Temperature °F (°C)			Barometer inch Hg (kPa)	
		gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Cooling medium	Air wet bulb	Air dry bulb		
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—580 rpm)									
21.79 (16.25)	2500	1.591 (6.021)	0.506 (0.308)	13.70 (2.699)	183 (84.1)	60 (15.5)	75 (23.8)	28.895 (97.574)	
Standard Power Take-off Speed (540 rpm)—One Hour									
20.78 (15.50)	2326	1.485 (5.622)	0.495 (0.301)	13.99 (2.756)	183 (83.8)	60 (15.8)	75 (23.7)	28.870 (97.490)	
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
19.38 (14.45)	2616	1.451 (5.491)	0.519 (0.315)	13.36 (2.632)	177 (80.6)	62 (16.4)	76 (24.2)	..... .....	
0.00 (0.00)	2733	0.528 (2.000)	..... .....	..... .....	168 (75.6)	62 (16.9)	76 (24.4)	..... .....	
9.85 (7.35)	2658	0.948 (3.590)	0.667 (0.406)	10.39 (2.046)	170 (76.7)	63 (17.2)	75 (23.9)	..... .....	
21.78 (16.24)	2500	1.589 (6.016)	0.506 (0.308)	13.70 (2.700)	185 (85.0)	64 (18.1)	77 (25.0)	..... .....	
5.01 (3.73)	2705	0.714 (2.705)	0.989 (0.601)	7.01 (1.380)	168 (75.3)	66 (18.6)	78 (25.3)	..... .....	
14.60 (10.89)	2628	1.195 (4.524)	0.567 (0.345)	12.22 (2.406)	172 (77.8)	65 (18.3)	77 (25.0)	..... .....	
Av Av	11.77 (8.78)	2640 (4.054)	1.071 (0.383)	0.630 (0.383)	10.99 (2.165)	173 (78.5)	64 (17.6)	76 (24.6)	28.823 (97.332)

## DRAWBAR PERFORMANCE

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption			Temp. °F (°C)			Barom. inch Hg (kPa)
					gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Cool- ing med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 7th (3H) Gear											
17.37 (12.95)	1135 (5.05)	5.74 (9.24)	2498	6.69	1.570 (5.942)	0.626 (0.381)	11.07 (2.180)	176 (80.0)	52 (10.8)	68 (20.0)	28.505 (96.257)
75% of Pull at Maximum Power—Ten Hours 7th (3H) Gear											
14.41 (10.74)	893 (3.97)	6.05 (9.74)	2594	5.27	1.371 (5.191)	0.659 (0.401)	10.51 (2.070)	168 (75.5)	45 (7.2)	48 (8.7)	29.039 (98.060)
50% of Pull at Maximum Power—Two Hours 7th (3H) Gear											
9.80 (7.31)	585 (2.60)	6.28 (10.10)	2657	3.96	1.137 (4.303)	0.804 (0.489)	8.62 (1.698)	169 (75.8)	44 (6.7)	57 (13.6)	28.735 (97.034)
50% of Pull at Reduced Engine Speed—Two Hours 8th (4H) Gear											
10.10 (7.53)	603 (2.68)	6.28 (10.11)	1983	3.83	0.902 (3.415)	0.619 (0.377)	11.19 (2.204)	168 (75.3)	45 (7.2)	62 (16.7)	28.740 (97.051)
MAXIMUM POWER IN SELECTED GEARS											
11.86 (8.84)	2346 (10.43)	1.90 (3.05)	2631	14.90	4th (4L) Gear			169 (76.1)	42 (5.6)	51 (10.6)	28.720 (96.983)
17.23 (12.85)	2268 (10.09)	2.85 (4.59)	2499	14.60	5th (1H) Gear			171 (77.2)	42 (5.6)	53 (11.7)	28.730 (97.017)
17.66 (13.17)	1549 (6.89)	4.28 (6.88)	2500	9.12	6th (2H) Gear			178 (81.1)	51 (10.6)	67 (19.4)	28.560 (96.443)
18.05 (13.46)	1180 (5.25)	5.74 (9.24)	2498	6.71	7th (3H) Gear			177 (80.6)	52 (11.1)	68 (20.0)	28.500 (96.240)
17.51 (13.06)	837 (3.72)	7.85 (12.63)	2499	4.70	8th (4H) Gear			175 (79.2)	50 (10.0)	66 (18.9)	28.560 (96.443)

Department of Agricultural Engineering

Dates of Test: April 6-15, 1978

Manufacturer: TOYOSHA CO., LTD., 55,  
Joshiji-16, Kadoma City, Osaka, Japan

**FUEL, OIL AND TIME:** Fuel No. 2 Diesel  
Cetane No. 50.4 (rating taken from oil company's  
typical inspection data) **Specific gravity con-  
verted to 60°/60° (15°/15°)** 0.8321 **Fuel weight**  
6.928 lbs/gal (0.832 kg/l) **Oil SAE 30 API service**  
**classification SE-CD To motor** 1.028 gal (3.891 l)  
**Drained from motor** 0.796 gal (3.031 l) **Trans-  
mission and final drive lubricant** A-C power fluid  
821 **Total time engine was operated** 36.5 hours.

**ENGINE Make** Toyosha Diesel **Type** 2 cylin-  
der vertical **Serial No.** 26 0197 **Crankshaft**  
lengthwise **Rated rpm** 2500 **Bore and Stroke**  
3.62" x 3.74" (92.0 mm x 95.0 mm) **Compression**  
**ratio** 23.0 to 1 **Displacement** 77 cu in (1263 ml)  
**Cranking system** 12 volt **Lubrication pressure**  
**Air cleaner** one paper element **Oil filter** full flow  
paper cartridge **Fuel filter** one paper element  
**Muffler** vertical **Cooling medium temperature**  
**control** thermostat.

**CHASSIS: Type** Standard **Serial No.** 5020-  
2135 **Tread width** rear 39.2" (995 mm) to 51.0"  
(1296 mm) front 37.4" (950 mm) to 44.1" (1120 mm)  
**Wheel base** 59.8" (1519 mm) **Center of gravity**  
(without operator or ballast, with minimum tread,  
with fuel tank filled and tractor serviced for oper-  
ation) Horizontal distance forward from center-  
line of rear wheels 20.8" (527 mm) Vertical distance  
above roadway 23.7" (602 mm) horizontal distance  
from center of rear wheel tread 0" (0 mm) to the  
right/left **Hydraulic control system** direct engine  
drive **Transmission** selective gear fixed ratio  
**Advised speeds mph (km/h)** first 0.9 (1.4) sec-  
ond 1.3 (2.0) third 1.7 (2.7) fourth 2.2 (3.6) fifth  
3.5 (5.6) sixth 4.9 (7.9) seventh 6.5 (10.4) eighth  
8.6 (13.9) reverse 1.7 (2.8), 6.8 (11.0) **Clutch**  
single dry disc operated by foot pedal **Brakes**  
drum and shoe operated by two foot pedals which  
can be locked together **Steering** mechanical  
**Turning radius** (on concrete surface with brake  
applied) right 87.8" (2.23 m) left 86.5" (2.20 m) (on  
concrete surface without brake) right 97.1" (2.47  
m) left 96.0" (2.44 m) **Turning space diameter** (on  
concrete surface with brake applied) right 179.6"  
(4.56 m) left 177.0" (4.50 m) (on concrete surface  
without brake) right 198.2" (5.03 m) left 196.0"  
(4.98 m) **Power take-off** 540 rpm at 2326 engine  
rpm.

**REPAIRS and ADJUSTMENTS:** No repairs or  
adjustments.

**REMARKS:** All test results were determined

# LUGGING ABILITY IN RATED GEAR 7th (3H)

Crankshaft Speed rpm	2498	2250	2002	1744	1503	1248
Pull—lbs (kN)	1180 (5.25)	1247 (5.55)	1267 (5.63)	1304 (5.80)	1311 (5.83)	1300 (5.78)
Increase in Pull %	0	6	7	11	11	10
Power—Hp (kW)	18.05 (13.46)	17.12 (12.77)	15.42 (11.50)	13.80 (10.29)	11.94 (8.91)	9.86 (7.35)
Speed—Mph (km/h)	5.74 (9.24)	5.15 (8.28)	4.57 (7.35)	3.97 (6.39)	3.42 (5.50)	2.84 (4.58)
Slip %	6.71	7.03	7.31	7.49	7.67	7.40

	TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power—Two Hours		94.5
75% of Pull at Maximum Power—Ten Hours		92.5
50% of Pull at Maximum Power—Two Hours		90.5
50% of Pull at Reduced Engine Speed—Two Hours		90.5
Bystander in 8th (4H) gear		79.0

## TIRES, BALLAST AND WEIGHT

		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Two 11.2/10-24; 4; 14 (95)	Two 11.2/10-24; 4; 14 (95)
	—Liquid (each)	290 lb (132 kg)	None
	—Cast Iron (each)	320 lb (145 kg)	None
Front Tires	—No., size, ply & psi (kPa)	Two 4.00-12; 4; 52 (360)	Two 4.00-12; 4; 52 (360)
	—Liquid (each)	None	None
	—Cast Iron (each)	39 lb (18 kg)	None
Height of Drawbar		13 in (330 mm)	13 in (330 mm)
Static Weight with Operator—	Rear	2564 lb (1163 kg)	1345 lb (610 kg)
	—Front	794 lb (360 kg)	715 lb (324 kg)
	—Total	3358 lb (1523 kg)	2060 lb (934 kg)

from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 144°F (62.1°C). Five gears were chosen between 15% slip and 10 mph (16.1 km/h).

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1270.

L. I. LEVITICUS  
Engineer-in-Charge

G. W. STEINBRUEGGE  
W. E. SPLINTER  
K. VON BARGEN  
Board of Tractor Test Engineers



Allis-Chalmers 5020 Dsl

The Agricultural Experiment Station  
Institute of Agriculture and Natural Resources  
University of Nebraska—Lincoln  
H. W. Ottoson, Director